

In re: Cho  
Serial No. 10/727,031  
Filed: December 2, 2003  
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### **REMARKS**

Applicant responds herein to each of the issues raised in the Office Action. Applicant appreciates the thorough examination of the present application and the indication of allowable subject matter in Claims 9, 21- 22 and 30-31. Applicant submits the present application is in form for allowance for the reasons discussed below.

#### **The Information Disclosure Statement (IDS) Mailed December 2, 2003:**

Applicant appreciates the Examiner's returning copies of the two PTO-1449 forms submitted with IDSs in this matter with the Examiner's signature thereon. However, in the interests of ensuring a clear record in this matter, Applicant requests a copy of the PTO-1449 from the IDS mailed December 2, 2003 that is signed **and** has the Examiner's initials next to each of the listed references so that it will be clear all the references have been considered. The Examiner's initials are included on the other PTO-1449 already.

#### **The Claim Objection:**

Claim 20 stands objected to based on a typographical error. Office Action, p. 2. Applicant appreciates the Examiner's thorough review of the claims and Claim 20 has been amended above to correct the misspelling of pn-junction. Accordingly, the objection to Claim 20 should be withdrawn as obviated.

#### **The Prior Art Rejections:**

Claims 1-8, 10-20 and 23-29 stand rejected as obvious under 35 U.S.C. § 103 in light of United States Patent No. 6,909,332 to Yin *et al.* ("Yin") in view of United States Patent No. 6,836,192 to Yang *et al.* ("Yang") and further in view of United States Patent No. 5,648,744 to Prakash *et al.* ("Prakash"). Office Action, p. 2. Applicant respectfully submits the rejected claims are allowable at least as the cited references do not disclose or suggest the recitations of the claims and cannot be combined in the manner relied on in the rejections.

To establish a *prima facie* case of obviousness, the prior art reference or references when combined must teach or suggest *all* the recitations of the claims, and there must be

some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. *See* M.P.E.P. § 2143. The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *See* M.P.E.P. § 2143.01(citing *In re Mills*, 916 F.2d 680, 16 U.S.P.Q.2d 1430 (Fed. Cir. 1990)). As emphasized by the Court of Appeals for the Federal Circuit, to support combining references, evidence of a suggestion, teaching, or motivation to combine must be clear and particular, and this requirement for clear and particular evidence is not met by broad and conclusory statements about the teachings of references. *In re Dembiczak*, 50 U.S.P.Q.2d 1614, 1617 (Fed. Cir. 1999). In another decision, the Court of Appeals for the Federal Circuit has stated that, to support combining or modifying references, there must be particular evidence from the prior art as to the reason the skilled artisan, with no knowledge of the claimed invention, would have selected these components for combination in the manner claimed. *In re Kotzab*, 55 U.S.P.Q.2d 1313, 1317 (Fed. Cir. 2000).

Furthermore, as stated by the Federal Circuit with regard to the selection and combination of references:

This factual question of motivation is material to patentability, and could not be resolved on subjective belief and unknown authority. It is improper, in determining whether a person of ordinary skill would have been led to this combination of references, simply to "[use] that which the inventor taught against its teacher." W.L. Gore v. Garlock, Inc., 721 F.2d 1540, 1553, 220 USPQ 303, 312-13 (Fed. Cir. 1983). Thus, the Board must not only assure that the requisite findings are made, based on evidence of record, but must also explain the reasoning by which the findings are deemed to support the agency's conclusion.

*In re Sang Su Lee*, 277 F.3d 1338, 1343 (Fed. Cir. 2002). As discussed in further detail below, Applicants submit that the Office Action has failed to establish a *prima facie* case of obviousness as the cited references do not disclose or suggest each of the recitations of the claims and a proper motivation to combine the references in the manner cited in the claims has not been established.

As an initial matter, Applicant notes that the primary reference Yin, was filed August

12, 2003 while the claims of the present application are fully supported by the Korean priority document, which was filed January 30, 2003 (see, for example, figures of the certified copy filed with this application). Accordingly, Yin only qualifies as prior art to the extent the matter relied on in the rejection is found in the earlier filed Provisional Application No. 60/403,457 ("the '457 application"). Based on the Applicant's review of a copy of the '457 application obtained from the USPTO Public PAIR system, Figures 14A-14C of Yin and the accompanying description are not found in the '457 application. Accordingly, the rejections of Claims 1-8, 10-20 and 23-29 should be withdrawn at least as Yin does not qualify as prior art against the present application.

Even were Yin to qualify as prior art, the rejections should be withdrawn. With regard to the rejection of Claim 1, the Office Action asserts that Yin "discloses a voltage controlled oscillator arrangement (vco) and method for changing the oscillation frequency of a vco having a vco 2702 that tunes the vco." Office Action, p. 2. The variable capacitance arrangement relied on in rejecting Claim 1 is described in the rejection as "like that of applicant's invention." Office Action, p. 2. However, while the Office Action acknowledges that Yin "does not explicitly show the control signals that control the switching elements," the Office Action fails to even consider that Claim 1 recites both a "**switched capacitor circuit**" and a "**switched varactor circuit**." As such, the switched capacitors 2706 of Yin, even were they to be considered as disclosing the switched capacitor circuit of Claim 1, do not also disclose or suggest the switched varactor circuit of Claim 1.

Figure 14B of Yin does show a varactor 2712 as does Figure 14C of Yin. However, in each of the embodiments of Figures 14B and 14C, the varactor is not switched. Instead, the value of the varactor 2712 is controlled in the conventional manner, by the control voltage. The capacitors of Yin, in contrast, are switched, as they would otherwise not be variable. As more generally described in Yin:

**A network of switchable tuning capacitors, a varactor, or other like tunable capacitor network, tune the VCO to function at a specific operating frequency. The VCO is tuned to function at a specific operating frequency by adjusting switch settings to a network of switchable tuning capacitors. These capacitors may comprise both coarse and fine tuning capacitors. Alternatively, the network may be supplemented or replaced by a varactor.(emphasis added)**

Yin, Col. 3, lines 39-47. Thus, a varactor is presented in Yin as an alternative to **switchable** capacitors with the switch not being included when a varactor is used.

The Office Action does assert that Yin is "silent on the exact structure of the capacitance that make-up the fine-tuning section." Office Action, p. 3. The Office Action then asserts that Prakash discloses a "switched varactor device" that would be used as the "fine switched capacitance arrangement" of Yin so as to improve phase noise characteristics of the vco." Office Action, p. 3. However, this combination is built on the incorrect assertion that Yin is "silent" on the structure. In fact, Yin clearly distinguishes its switched capacitors from varactors as discussed above. Prakash also appears to include no suggestion of combining a switched capacitor circuit with its switched varactor diodes. Similarly, the application No. 08/577,174 (now US Patent No. 5,739,730) cited in Prakash also appears to suggest no such motivation. Accordingly, the rejection of Claims 1-8, 10-20 and 23-29 should also be withdrawn at least as the references cannot be combined in the manner relied on in the rejections.

The rejections also disregard various recitations related to limiting variation in gain and particular capacitance values in determining patentability in a manner that further illustrates the unsupportable nature of the rejections. Office Action, pp. 3-4. As described for some embodiments of the present invention, the paired switching of a capacitor and varactor in the circuit may provide for improved performance in gain control over prior art systems. In other words, it is the changing of both a varactor and a capacitor value that is used to limit gain variation, and no such combination of switchable components is disclosed or suggested by any of the cited references. Furthermore, the selection of the values of capacitors in Yin appears to be linked to matched changes in the drive circuits with variable delay. As stated in Yin:

This disclosure teaches an improved method for tuning the individual drivers. Since VCO 2702 may be tuned with a switched network of capacitors wherein switch 2703 settings constitute a tuning setting for the selected operating frequency, the tuning setting may be transferred to tuning capacitors associated with the individual delay elements or output drivers in order to tune the output drivers to the same operating frequency as VCO 2702. This is possible since the

capacitance values associated with switching network 2706 are consistent with a switched capacitor network associated with drivers like output driver 2615 of FIG. 11. Thus, consistent settings recorded from a tuned VCO may be supplied to the output driver.

Yin, Col. 13, lines 44-57. Thus, the selection of values is not merely a "result effective variable" as the result desired in Yin relates to matching with a capacitor switched drive circuit, not matching of capacitor and varactor values. Similarly, if anything, the distinction between otherwise non-distinguishable "coarse" and "fine" tuning capacitors in Yin would appear to suggest a difference in the value of the capacitors was the only distinction and that the respective capacitors in each section would just as likely be beneficially identical to facilitate driver matching. The different results desired from Yin and the oscillator of Claim 1 further illustrate that the combination of references relied on in the rejection is unsupported.

Independent Claim 14 and independent method Claims 11 and 23 contain recitations similar to those discussed with reference to Claim 1 and are likewise patentable for at least substantially similar reasons as those discussed with reference to Claim 1.

The dependent claims are patentable at least based on their dependence from patentable independent claims. In addition, various of the dependent claims are separately patentable. For example, Claims 9, 21-22 and 30-31 are also separately patentable for at least the reasons they were indicated as containing allowable subject matter in the Office Action.

Claims 2, 4 and 12-13 contain recitations related to limiting gain variation that are, as a practical matter, disregarded in the Office Action by asserting that "Yin will limit the variation." Office Action, p. 3. However, as discussed above, the limitation as recited in these claims is linked to changing both a switched varactor and a switched capacitor. In fact, Claims 4 and 13 recite setting the switches "substantially simultaneously." As no such capability is provided in Yin, Yin does not disclose control over selection or setting of switches in use to "limit variations." At most, Yin may allow for selection of values of components switched, which inherently results in a gain variation, not control of such gain variation in operation. Accordingly, Claims 2, 4 and 12-13 are also separately patentable for at least these reasons.

Claims 6-7, 17-18 and 26-27 include recitations related to selection of particular

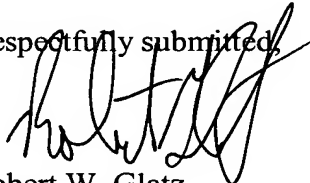
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capacitance values across components in a respective switched circuit/unit. As noted above, the Office Action treats such recitations as nothing more than a "result effective variable" in applying Yin to reject these claims. However, as discussed above, such an assertion is not supportable in light of the differences between the circuit described in Yin and the recitations of these claims. Accordingly, Claims 6-7, 17-18 and 26-27 are also separately patentable for at least these additional reasons.

### CONCLUSION

Applicant respectfully submits that, for the reasons discussed above, the references cited in the present rejections do not disclose or suggest the present invention as claimed. Accordingly, Applicant respectfully requests allowance of all the pending claims and passing this application to issue.

Respectfully submitted,

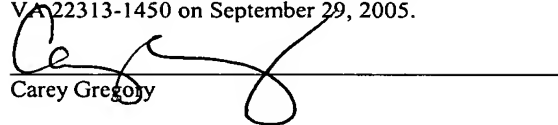


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Carey Gregory